

Societies and Academies.

LONDON.

Royal Society, June 30.—C. Chree and J. M. Stagg: Recurrence phenomena in terrestrial magnetism. Making use of the daily international character figures for 1906 to 1925 issued from De Bilt, an attempt is made to enlarge our knowledge of the 27-day interval in terrestrial magnetism. Assuming magnetic disturbance to be caused by some kind of electrical discharge from the sun, if sunspots were the sole or principal source of the discharge, we should expect the interval to be longer in years of high than in years of low spot latitude. No recognisable difference is, however, found. In opposition to results obtained by Dr. Deslandres, no trace is found of periods which are submultiples of 27 days. On the other hand, days which follow from 4 to 6 days after a very quiet day prove to have a greater than average chance of being highly disturbed days.

S. Chapman: On certain average characteristics of world-wide magnetic disturbance. The average characteristics of slight magnetic disturbance in the middle belt of the earth, between northern and southern latitudes of 50° or 60° , are similar to those of intense disturbance (magnetic storms) in the same region.

G. I. Taylor: The distortion of crystals of aluminium under compression (Part ii.). Changes in orientation of crystal axes during compression of a disc cut from a single crystal of aluminium are in accordance with the prediction made on the assumption that the crystal slips as determined by distortion measurements. As with tensile test pieces, the crystal axes always take a position where two possible planes of slip are symmetrically disposed in relation to the stress, but the orientation is different. After the axes have taken the symmetrical position, they remain there, even when distortion is very great. Distortion during the period when the crystal axes remain in the symmetrical position is due to slipping on two symmetrically disposed planes of slip.

G. I. Taylor: The distortion of crystals of aluminium under compression (Part iii.). Several experiments were devised to find out whether it is possible to measure the internal stresses in a compressed disc. The relationship between shear stress and amount of shear is found for tensile and for compression specimens, when slipping is confined to one plane. The experimental results in the two cases are identical. The fact that the component of force normal to plane of slip is a pressure in one case and a tension in the other makes no measurable difference to resistance to slipping for given amount of slip. During double slipping, resistance to shear increases more rapidly for a given total amount of slipping than when all slip is confined to one plane. Resistance to shear goes on increasing up to the greatest amounts of distortion used.

Prof. J. C. McLennan, H. J. C. Ireton, and K. Thomson: The luminescence of solid nitrogen under cathode ray bombardment. The phosphorescence bands N_2 (5230 Å.U.) and N_4 (5945 Å.U.) have complex structures, the former having eight and the latter three components. The moment of inertia of the molecular system involved in the phosphorescence of solid nitrogen is 3×10^{-40} . The group of bands N_2 near 5577 Å.U. originate in a modification of nitrogen different from that involved in the production of the bands N_2 and N_4 .

E. T. Paris: On the reflexion of sound from a porous surface. The 'acoustical admittance per unit area' can be measured experimentally by means of

the 'stationary-wave' apparatus for testing sound-absorption, and when it is known, the coefficient of absorption (for the particular wave-length at which the admittance has been measured) can be calculated by a simple formula for any angle of incidence. For an 'acoustic plaster' there is a large variation of absorption with change of angle of incidence, the coefficient increasing from 0.28 at normal incidence to 0.76 at about 83° and then falling to zero at grazing incidence. Heavy absorption at very oblique incidence appears to be characteristic of plasters of this kind.

C. J. Smith: A new differential dilatometer for the determination of volume changes during solidification. The dilatometer has two bulbs immersed in a thermostat, the change of volume of the substance contained in one bulb being compared with that of a corresponding volume of nitrogen in the other. The difference of pressure of the nitrogen in the two bulbs is measured by withdrawing a known volume of mercury from a small reservoir attached to the appropriate side of the dilatometer. The advantage over other dilatometers used for the same purpose lies in the possibility of obtaining definite and steady conditions of temperature.

R. C. Johnson and H. G. Jenkins: The band spectra of silicon fluoride. Some eight band systems or groups—all except one new—are recorded and attributed to silicon fluoride. Two band systems attributed to a fluoride of sulphur were encountered in the experimental work. To two of the band systems of silicon fluoride, named α and β , have been assigned vibrational quantum numbers. A third, the γ system, is shown to be related, and a fourth system has been partially analysed. The heat of dissociation of the $FSi-SiF$ molecule is of the order of 5 volts or 116000 calories.

T. W. Wormell: Currents carried by point-discharges beneath thunderclouds and showers. Upward currents were found generally greater than downward currents. The maximum value attained during a shower by the discharge current from the single point, which was at a height of about 8 metres, was frequently between 1 and 10 microamp. The net quantity of positive electricity discharged during a shower was commonly of the order 10^{-2} coulomb. The total net transfer of positive electricity from the point during 8 months was 0.17₃ coulomb, the quantities passing upward and downward being 0.25₅ coulomb and 0.08₂ coulomb respectively. The transfer of electricity observed is thus opposite in direction to the normal ionisation current of fine weather, and also to the convection current carried by precipitation. In the case of several showers, the phenomena observed consisted of a downward current as the cloud approached, a large upward current beneath the centre of the shower, and a downward current towards the end of the shower. The distribution of electric field below the cloud suggests that in these cases the cumulo-nimbus cloud was bipolar, with upper charge positive, and lower charge negative.

A. M. Taylor and E. K. Rideal: The effective moment of the sulphur complex. The absorption spectrum of sulphur has been examined in the infra-red between 1μ and 14μ . The chief maxima occur at 7.7μ and 11.9μ , and the form of curve is the same for rhombic, prismatic, liquid and plastic varieties, the maxima being very little shifted from one modification to another. The depth of the absorption band at 11.9μ is somewhat remarkable, in view of the absence of charged ions in the element. The 'effective charge' on the vibrating particles in sulphur is about 0.7 electron, indicating an inter-atomic linkage which approximates to one of hetero-

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show that light quanta, as generally understood, are less than 3 cm. long, and that an electron absorbs a light quantum in less than 10^{-10} sec.—L. A. Sommer: Bands in the extreme ultra-violet spectrum of a helium discharge. Lyman's so-called line at $\lambda 600.3 \pm 0.6$ appears to be a band corresponding to a transition $1^3S - 2^3S$ in the helium molecule.—W. N. Birchby: White-light interference fringes with a thick glass plate in one path (Part 2).—G. W. Stewart and Roger M. Morrow: Molecular space array in liquid primary normal alcohols: the cybotactic state. The X-ray circular diffraction haloes in these alcohols show that one distance observed increases by approximately 1.54 \AA.U. with each CH_2 group added to the chain, while another distance, varying from 4.6 \AA.U. for lauryl to 3.8 \AA.U. for methyl, seems to be due to the separation of the molecules perpendicular to the chain. The results indicate a space array permitting of molecular mobility in the liquid which is termed 'cybotaxis'.—Carl Barus: Pinhole probe measurements with massive cylindrical air columns.—Jared Kirtland Morse: Atomic lattices and atomic dimensions. Models of cubic and hexagonal lattices can be built up using a modified cubic atom concept, and possible atomic radii are calculated. One striking result is that the atomic radius of the carbon atom in diamond is 0.77 \AA.U. while in graphite it is 0.75 \AA.U. , and both lattices consists of cubes having one corner in common.—Paul S. Epstein: The magnetic dipole in undulatory mechanics.—R. A. Brink and C. R. Burnham: Nucleus and cytoplasm in relation to differential pollen-tube growth. 'Sugary' maize plants bear a lower proportion of 'waxy' seeds than plants carrying the dominant 'non-sugary' factor. Recognising two stages of growth in the pollen-tube, dependent respectively on (1) the food reserves of the pollen grain, and (2) on food materials supplied by the tissues of the pistil, a differential rate of growth is found in the first stage.—J. T. Buchholz and A. F. Blakeslee: Abnormalities in pollen-tube growth in *Datura* due to the gene 'tricarpep'. Many of the pollen-tubes from pollen carrying the 'tricarpep' gene burst at their tips and the protoplasm is extruded, leading to a deficiency in 'tricarpep' individuals in crosses.—M. Demerec: Magenta-alpha—a third frequently mutating character in *Drosophila virilis*.—Dontcho Kostoff: Pollen-tube growth in *Lythrum salicaria*. Pollen-tube growth in fertile pollinations is accelerated in the later stages in contrast with that occurring in unfertile pollinations.—William Hovgaard: Bending of a quasi-ellipsoidal shell with special reference to rigid airships. Two deformations other than simple bending are involved: (a) a downward movement of the framework due to shearing deflexions of the whole ship; (b) a deformation of the transverse frames due to unequal loading.—H. Walter Leavitt and John W. Gowen: Influence of iron content on mortar strength. The tensile strength of mortar (after both 7-day and 28-day periods) increases with increasing iron content in the sand used; compressional strength is unaffected.

Diary of Societies.

SATURDAY, JULY 16.

INSTITUTION OF MUNICIPAL AND COUNTY ENGINEERS (Eastern District Meeting) (at Guildhall, Cambridge), at 2.

TUESDAY, JULY 19.

ROYAL SOCIETY OF MEDICINE, at 5.30.—General Meeting.

SATURDAY, JULY 23.

PHYSIOLOGICAL SOCIETY (in Physiological Laboratory, University, Edinburgh).

CONGRESS.

JULY 19 TO 22.

BRITISH MEDICAL ASSOCIATION (at Edinburgh).

Tuesday, July 19, at 8 P.M.—Sir Robert Philip: Presidential Address.

Wednesday, July 20 (in McEwan Hall), at 8 P.M.—Lister Centenary Celebration, presided over by the Earl of Balfour, and addresses by Sir W. Watson Cheyne, Bart., Prof. Tuffier, Prof. H. Cushing, and Dr. J. Stewart.

Wednesday, July 20.—Discussion: The Results of Insulin Therapy in Diabetes Mellitus.—Discussion: Tuberculosis of the Kidney.—W. Rankin: The Treatment of Acute Osteomyelitis by Primary Diaphysectomy.—Discussion: The Relation of Pregnancy to General Diseases.—Discussion: Growth in its Pathological Relations.—Discussion: Clinical Methods of Administration and Therapeutic Uses of Oxygen.—Prof. J. A. Gunn: Expectorants.—Discussion: Acute Pneumonia in Early Childhood.—Discussion: Chronic Sepsis as a Cause of Mental Disorder.—Discussion: The Tics and Allied Conditions.—Discussion: Optic Neuritis.—Discussion: Neurological and Mechanical Factors underlying Immobility of the Vocal Cords; their Diagnosis, Prognosis, and Principles of Treatment.—N. Patterson: Some Diseases Affecting the Thyro-glossal Tract.—Dr. D. H. Ballou: The Study of Bronchopulmonary and Pleural Lesions by the Bronchoscopic Method with the Aid of Iodised Oil (Lipiodol).—Discussion: Should all Public Health Administration—Municipal, School, Factory, etc.—be concentrated under a Single Department, and the Immediate Control in each Executive Area be vested in a Single Individual?—Discussions: Amoebic Dysentery; Some Problems of Malaria Prophylaxis.—Discussions: X-Rays in the Diagnosis of Intrathoracic Growth; X-Rays and Radium in the Treatment of Carcinoma of the Breast.

Thursday, July 21.—Discussion: The Treatment of Acute Lobar Pneumonia.—Dr. D. H. Ballou: The Value of the Bronchoscopic Injection of Lipiodol in the Diagnosis and Treatment of Tuberculosis, Lung Abscess, and Bronchiectasis.—The Place of Surgery in the Treatment of Toxic Goitre.—Sir Almoth E. Wright: The Rational Treatment of Infected Wounds.—Discussion: The Hygiene of Menstruation in Adolescents.—Discussion: Immunity.—Discussion: The Therapeutic Uses of Calcium Salts.—Discussion: Epidemic Encephalitis in Infancy and Childhood.—Discussion: Epidemic Encephalitis.—Miss I. C. Mann: Some Aspects of the Comparative Development of the Retina.—Sir W. T. Lister: Some Points in Connection with Detachment of the Retina.—W. G. Souter: Spontaneous Reattachment of Detached Retina.—Sir Arnold Lawson: Value of Antiseptics in Modern Ophthalmic Surgery.—F. H. Diggle: Relationship between Lacrymal Obstruction and Nasal Disease.—H. M. Traquair: Incidence of Tobacco Amblyopia in Edinburgh and District.—A. H. H. Sinclair: Remarks on Intracapsular Extraction of Cataract, and Demonstration.—Discussion: Otosclerosis.—Dr. S. Young: Radiography in Mastoid Disease.—Dr. A. J. Wright: To what Extent does the Removal of Tonsils and Adenoids prevent Ear Disease.—Discussion: What Duties has the State in Relation to the Nation's Food Supply regarding Research, Instruction of Parents, Maintenance of Supplies, and Cooking Facilities?—Dr. W. E. Cooke, Sir Thomas Oliver and Prof. S. McDonald: Pulmonary Asbestosis.—Discussion: The Structure and Function of the Spleen.—Prof. P. T. Herring: The Pineal Gland.—Prof. D. M. Lyon and Dr. W. Robson: Cystinuria.—Dr. J. C. Bramwell: Form of the Pulse Wave.—Prof. J. A. MacWilliam and Prof. G. S. Melvin: Optimal Rhythm in the Mammalian Heart and the Action of the Cardiac Nerves.—Dr. O. Reid: The Mechanism of Voluntary Muscular Fatigue.—Prof. H. E. Roaf: The Quantitative Measurement of Defects in Colour Vision.—Prof. B. A. McSwiney: Structure and Movements of the Cardia.—Discussion: The Influence of Internal Secretions on Sex Characters.—Discussion: Immunity.—Discussion: The Uses and Limitations of Ultra-Violet Radiations in Dermatology.—Dr. H. C. G. Semon: The Value of Krysolgan in Lupus Erythematosus.—Dr. G. B. Dowling: The Treatment of Tinea Capitis with Thallium Acetate.—Discussions: Alcohol and the Motorist.—The Teaching of Forensic Medicine.

Friday, July 22.—Discussion: The Pathology and Treatment of Pernicious Anemia.—Dr. A. Blackhall-Morison: Coronary Angina Pectoris.—Discussion: Chronic Appendicitis.—A. McLennan: Burns.—Dr. F. A. E. Crew: The Effect upon the Sex Ratio of Conception Early and Late in Relation to the Estrous Cycle of the Rat.—Dr. D. A. Miller: Paired Forceps Cases.—Dr. B. Dougal: The Clinical Features of Ectopic Pregnancy.—Dr. D. B. Solomons: Some Points in the Technique of the Low Segment Cesarean Operation.—Prof. W. F. Shaw: Uterine Fibroids after the Menopause.—Discussion: Aspects and Problems of Comparative Medicine.—Discussion: The Action and Uses of Ovarian Extracts.—Discussion: Therapeutic Modification of the Diet in Infancy; what can be achieved by it?—Discussion: Points in the Lunacy Commission (England) Report—(a) Are the existing safeguards against wrongful detention adequate? (b) How far is judicial intervention necessary in the process of certification? (c) What additional facilities are required for early treatment?—Discussion: Chemical Changes accompanying Muscular Activity.—Prof. J. Mellanby: Bile as the Alimentary Stimulus for Pancreatic Secretion.—Prof. J. Taib: Natural Arrest of Haemorrhage from a Wound.—Dr. H. W. Davies and Prof. B. A. McSwiney: Circulation Rate.—Prof. R. J. S. McDowall: Physiological Considerations in High Blood Pressure.—Dr. C. R. Harington: The Constitution of Thyroxine.—Discussion: Haemolysis.—Discussion: Aspects and Problems of Comparative Medicine.—Discussions: Radiology and Diagnosis of Intrathoracic Tuberculosis from the Point of View of Specialist and Practitioner; Pathology of the Tuberculosis of Childhood and its Bearing on Clinical Work; Interrelation of Physician and Surgeon in regard to Non-pulmonary Tuberculosis.—Discussion: The Value of Routine Examination of the Cerebro-spinal Fluid with regard to (a) More Accurate Knowledge, (b) Prognosis, (c) Treatment.—Discussions: The Employment of 'Polar-Body' Developing Strains of the Gonococcus in the Treatment of Gonococcal Infection; The Place of Bismuth in the Treatment of Syphilis.—Discussion: The Historic Evolution of Disease.—Dr. G. M. Cullen: World Epidemics and their Relationship in Cause and Effect to Social Conditions.—Miss M. C. Buer: The Effect of Early Industrialism upon the Health of the Community.—Prof. A. J. Clark: The Historical Aspects of Quackery.—Prof. W. J. Dilling: The Methods of Introduction of Drugs.—Discussion: The Future Relationship of Municipalities to the Voluntary Hospitals of this Country.